UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/662,465	09/16/2003	Shiquan Wu	71493-1202 /pw	9622

7590   08/24/2010

SMART & BIGGAR
P.O. Box 2999, Station D
900-55 Metcalfe Street
Ottawa, ON K1P 5Y6
CANADA

EXAMINER
ADHAMI, MOHAMMAD SAJID

ART UNIT	PAPER NUMBER
2471	

MAIL DATE	DELIVERY MODE
08/24/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/662,465	WU ET AL.
	Examiner	Art Unit	
	MOHAMMAD S. ADHAMI	2471	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 June 2010*.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-92* is/are pending in the application.

    4a) Of the above claim(s) *10-14,16-18,24-29,31-53,61,63,65-70,73-78,88-92* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9,15,19-23,30,54-60,62,64,71,72,79-87* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____ .

DETAILED ACTION

- Applicant's amendment filed 6/14/2010 is acknowledged.

- Claims 10-14,16-18,24-29,31-53,61,63,65-70,73-78, and 88-92 are withdrawn

  form consideration.

- Claims 1-92 are pending.

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2.   Claims 1,2,9,15,54,55,71,79, and 80 are rejected under 35 U.S.C. 102(e) as

being anticipated by Vandenameele-Lepla (US App. 2003/0058787).

Re claims 1,15,54,71,79 and 80:

Vandenameele-Lepla discloses *transmitting a signal comprising OFDM*

units (Para.[0003] OFDM is one type of multi-carrier data transmission technique

and Para.[0004] In OFDM the sub-carrier pulse used for transmission is chosen

to be rectangular and Para.[00014] To preserve orthogonality between the

carriers and to mimize ISI caused by multi-path signals, a guard period is

inserted between transmitted symbols - where the transmitted symbols are

OFDM units).

Vandenameele-Lepla further discloses *each OFDM transmission*

comprising an OFDM symbol and before/and/or/after the OFDM symbol a

respective non-OFDM segment (Para.[0004] One method transmits a known

sequence and Para.[0006] The subsets of the plurality of time-domain signals

includes training symbols that are embedded into the data for channel estimation

purposes and Para.[00014] To preserve orthogonality between the carriers and

to mimize ISI caused by multi-path signals, a guard period is inserted between

transmitted symbols - where the transmitted symbols are OFDM units).

Vandenameele-Lepla further discloses *the non-OFDM segment containing*

known data and/or unknown highly reliable data (Para.[0006] The subsets of the

plurality of time-domain signals includes training symbols that are embedded into

the data for channel estimation purposes and Para.[0022] known training

sequence – where the training sequence is known and/or unknown highly reliable

data).

Vandenameele-Lepla further discloses *the non-OFDM segment allowing a*

conversion at a receiver between a linear convolution and a cyclic convolution for

the OFDM symbol (Para.[0016] Another advantage of this embodiment resides in

that fact that the division operation performed for channel estimation converts to

a cyclic convolution in the time domain. Furthermore, because the training

sequence can be chosen to be cyclic, the cyclic convolution can be performed by a non-cyclic convolution).

Re claims 2 and 55:

Vandenameele-Lepla discloses *the non-OFDM segment being at least long enough to cover any significant ISI introduced by a previous OFDM symbol* (Para.[00014] To preserve orthogonality between the carriers and to mimize ISI caused by multi-path signals, a guard period is inserted between transmitted symbols - where the transmitted symbols are OFDM units).

Re claim 9:

Vandenameele-Lepla discloses *a guard time on either side of each non-OFDM segment* (Para.[00014] To preserve orthogonality between the carriers and to mimize ISI caused by multi-path signals, a guard period is inserted between transmitted symbols).

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2.   Claims 3-6 and 56-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vandenameele-Lepla in view of Krishnan (US 6,928,062).

Re claims 3-6 and 56-60:

As discussed above, Vandenameele-Lepla meets all the limitations of the

parent claim.

Vandenameele-Lepla does not explicitly disclose *a code separated pilot*

channel, signaling channel, and traffic channel, multiple channels that are time

division multiplexed, and IFFT.

Krishnan discloses *a code separated pilot channel, signaling channel, and*

traffic channel, multiple channels that are time division multiplexed, and IFFT

(Fig.6 ref. 622 is a pilot channel ref.624 is a signaling channel and ref.630 is a

traffic channel and Col.3 lines 59-65 These techniques may also be used for

hybrid systems such as an OFDM TDM system that transmit pilot/signaling and

traffic data using time division multiplexing, whereby OFDM is used for

pilot/signaling and another transmission scheme is used for traffic data and Col.5

lines 10-11 an inverse fast Fourier transform (IFFT) to obtain a transformed

symbol).

Vandenameele-Lepla and Krishnan are analogous because they both

pertain to data communication.

It would have been obvious to one of ordinary skill in the art at the time of

the invention to modify Vandenameele-Lepla to include a signaling, traffic, and

pilot channel as taught by Krishnan in order to use a well-know transmission

scheme.

3.   Claims 7,8, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Vandenameele-Lepla in view of Walton (US App. 2004/0081131).

Re claims 7 and 8:

As discussed above Vandenameele-Lepla meets all the limitation of the

parent claim.

Vandenameele-Lepla does not explicitly disclose *generating OFDM*

symbols using fixed duration with varying IFFT size and generating the non-

OFDM segments to have fixed duration with varying numbers of sample.

Walton discloses *generating OFDM symbols using fixed duration with*

varying IFFT size and generating the non-OFDM segments to have fixed duration

with varying numbers of sample **(Para.[0040] the OFDM symbol size for some**

time segments may be fixed for other time segments may be configurable and

Para.[0101] variable-size IFFT**).**

Vandenameele-Lepla and Walton are analogous because they both

pertain to data communication.

It would have been obvious to one of ordinary skill in the art at the time of

the invention to modify Vandenameele-Lepla to include OFDM symbols using

fixed duration and varying IFFT size as taught by Walton in order to allow the

transmitter and receiver to be correlated and to adapt the data transmission to

increase efficiency.

Re claim 23:

As discussed above Vandenameele-Lepla meets all the limitation of the

parent claim.

Vandenameele-Lepla does not explicitly disclose *transmitting data content*

of multiple users on the OFDM symbol.

Walton discloses *transmitting data content of multiple users on the OFDM*

symbol (Para.[0010] For OFDMA, multiple users share the large OFDM symbol).

Vandenameele-Lepla and Walton are analogous because they both

pertain to data communication.

It would have been obvious to one of ordinary skill in the art at the time of

the invention to modify Vandenameele-Lepla to include transmitting data content

of multiple users on OFDM symbols as taught by Walton in order to use a well-

known transmission scheme.

4.   Claims 19,64,80,81, and 85 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Vandenameele-Lepla in view of Hiramatsu (US 7,298,692).

Re claims 19,64,80,81, and 85:

As discussed above, Vandenameele-Lepla meets all the limitations of the

parent claim.

Vandenameele-Lepla does not explicitly disclose *transmitting a first,*

second, and third segment and a first and second non-OFDM segment where at

least one of the data segments is OFDM and CDMA.

Hiramatsu discloses *transmitting a first, second, and third segment and a first and second non-OFDM segment where at least one of the data segments is OFDM and CDMA* (Col.5 lines 16-19 a preamble portion is a CDMA signal, a data portion is an OFDM signal, and both signals are multiplexed to be transmitted and Fig.1 and Col.2 lines 44-51 using OFDM signals or OFDM/CDMA signals over the downlink and CDMA signals over the uplink).

Vandenameele-Lepla and Hiramatsu are analogous because they both pertain to data communication.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Vandenameele-Lepla to include transmitting a first, second, and third segment and a first and second non-OFDM segment where at least one of the data segments is OFDM and CDMA as taught by Hiramatsu in order to ensure transmission quality while improving spectral efficiency.

5.   Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vandenameele-Lepla in view of Hiramatsu as applied to claim 19 above, and further in view of Walton (US App. 2004/0085892 referred to as Walton2 below).

Re claim 20:

As discussed above, Vandenameele-Lepla meets all the limitations of the parent claims.

Vandenameele-Lepla does not explicitly disclose *being compatible with IS-856.*

Walton2 discloses *being compatible with IS-856* (Para.[0005] the system

may also be designed to implement IS-856).

Vandenameele-Lepla and Walton2 are analogous because they both

pertain to data communication.

It would have been obvious to one of ordinary skill in the art at the time of

the invention to modify Vandenameele-Lepla to include being compatible with IS-

856 as taught by Walton2 in order to make a more robust system.

6.   Claims 21,22,82-84,86, and 87 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Vandenameele-Lepla in view of Hiramatsu as applied to claims

19,81, and 85 above, and further in view of Montojo (US 6,693,920).

Re claims 21,22,82-84,86, and 87:

As discussed above, Vandenameele-Lepla meets all the limitations of the

parent claims.

Vandenameele-Lepla does not explicitly disclose *segments of 224,400,*

and 2048 chips, 64 MAC segment and a 96 chip pilot segment.

Montojo discloses *segments of 224,400, and 2048 chips, 64 MAC*

segment and a 96 chip pilot segment (Fig. 2 – where the 2 MAC chips and pilot

chip make up a 224 chip segment).

Vandenameele-Lepla and Montojo are analogous because they both

pertain to data communication.

It would have been obvious to one of ordinary skill in the art at the time of

the invention to modify Vandenameele-Lepla to include segments of 224,400,

and 2048 chips, and 64 MAC segment and a 96 chip segment as taught by

Montojo in order to use a well-known transmission format.

7.   Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over

Vandenameele-Lepla in view of Yakhnich (US 6,907,092).

Re claim 30:

        As discussed above, Vandenameele-Lepla meets all the limitations of the

parent claim.

        Vandenameele-Lepla does not explicitly disclose *3 tail bits, a 58 point idft,*

a 26 bit training sequence, a second 58 point symbol, 3 tail bits, a 8.25 bit

duration guard period.

        Yakhnich discloses *3 tail bits, a 58 point symbol, a 26 bit training*

sequence, a second 58 point symbol, 3 tail bits, a 8.25 bit duration guard period

(Fig.2).

        Vandenameele-Lepla and Yakhnich are analogous because they both

pertain to network communications.

        It would have been obvious to one of ordinary skill in the art at the time of

the invention to modify Vandenameele-Lepla to include 3 tail bits, 58 points

symbols and a 8.25 guard period as taught by Yakhnich in order to minimize the

time varying effects **(Yakhnich Col.2 lines 52-54).**

8.   Claim 62 is rejected under 35 U.S.C. 103(a) as being unpatentable over

Vandenameele-Lepla in view of Montojo.

Re claim 62:

As discussed above Vandenameele-Lepla meets all the limitations of the parent claim.

Vandenameele-Lepla does not explicitly disclose *a 64 chip MAC segment, a 96 chip pilot segment, and a 64 chip MAC segment*.

Montojo discloses *a 64 chip MAC segment, a 96 chip pilot segment, and a 64 chip MAC segment* (Fig. 2 ref.208A, 206A, and 208A).

Vandenameele-Lepla and Montojo are analogous because they both pertain to data communications.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Vandenameele-Lepla to include a 64 bit MAC segment and a 96 bit pilot segment as taught by Montojo in order to use a well-known transmission format.

Response to Arguments

9.   Applicant's arguments filed 6/14/2010 have been fully considered but they are not persuasive.

In the remarks, Applicant contends Vandenameele-Lepla does not disclose a non-OFDM segment before/and/or/after an OFDM symbol because the guard period is a cyclic extension of OFDM symbol.

The Examiner respectfully disagrees. Vandenameele-Lepla does disclose a non-OFDM segment before/and/or/after an OFDM symbol (Para.[0004] One

method transmits a known sequence and Para.[0006] The subsets of the

plurality of time-domain signals includes training symbols that are embedded into

the data for channel estimation purposes and Para.[00014] To preserve

orthogonality between the carriers and to mimize ISI caused by multi-path

signals, a guard period is inserted between transmitted symbols - where the

transmitted symbols are OFDM units). The guard period may contain does not

necessarily contain only an extension of the OFDM symbol. A guard period may

contain a partial extension of the OFDM symbol along with a zero amplitude

signal, which is a non-OFDM symbol.

In the remarks, Applicant Vandenameele-Lepla does not disclose a non-

OFDM segment before/and/or/after a OFDM symbol because the training

symbols disclosed in Vandenameele-Lepla are embedded prior to the IFFT

function and therefore are modulated with the rest of the data symbols.

The Examiner respectfully disagrees. Vandenameele-Lepla does disclose

a non-OFDM segment before/and/or/after a OFDM symbol (Para.[0004] One

method transmits a known sequence and Para.[0006] The subsets of the

plurality of time-domain signals includes training symbols that are embedded into

the data for channel estimation purposes and Para.[00014] To preserve

orthogonality between the carriers and to mimize ISI caused by multi-path

signals, a guard period is inserted between transmitted symbols - where the

transmitted symbols are OFDM units). The training sequences are handled after

the IFFT block **(Para.[0006]** The subset of the plurality of time-domain signals

includes training symbols – where the time-domain signals occur after the IFFT

processing**)** and therefore are before/and/or/after the OFDM symbol.

Furthermore, even if the training sequences are embedded before IFFT

processing, this still reads on the limitation of a non-OFDM segment being

before/and/or/after a OFDM symbol.

Conclusion

10.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure. Lawrey ("OFDM as a modulation technique for wireless

communications with a CDMA comparison") shows a guard period with a cyclic

extension and a zero amplitude signal.

11.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

        A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MOHAMMAD S. ADHAMI whose telephone number is (571)272-8615. The examiner can normally be reached on Monday-Friday 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on (571)272-3179. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mohammad S Adhami/   /Chi H Pham/
Examiner, Art Unit 2471   Supervisory Patent Examiner, Art
                                              Unit 2471